



Glazing Green Timber Frames With
Carpenter *Oak* & Woodland



Carpenter Oak & Woodland has made more bespoke hand-crafted frames than any other UK company. Renowned for its design excellence, quality of craftsmanship and customer care, it has been the recipient of many prestigious awards, but more importantly, thousands of delighted customers.

Choosing the right company to glaze your green timber frame is essential to ensure that the aesthetic results are pleasing and critically that the glazing system performs by keeping the building wind and weather tight, even after the frame has settled in.

We hope that this brief document will help you find the glazing solution for your project, and answer some questions you might have. However, there is no substitute for talking and we would be delighted to discuss your project with you.

Introduction

The unique nature of green timber and frames constructed from it means that the glazing systems employed are of critical importance, as is the knowledge and competency of the supplier you chose to carry out the work.

Carpenter Oak & Woodland are one of the UKs most highly regarded and longest established specialists in timber buildings. With over 20 years experience of manufacturing the finest timber frames, we understand how best to glaze them and how to overcome the particular challenges that the material presents.

Today we operate a specialist glazing division to meet the various needs of our customers, offering good value glazing services and the unrivalled guarantee of our name and reputation, as well as a comprehensive warranty.

Glazing green frames – The issues

Oak frames are manufactured in 'green' oak. This means that the initial moisture content of the timber is relatively high. As the timber dries out it shrinks by up to 8% across its width (although not across its length), and depending on the quality of timber in the frame, can also twist. *For more information on the behaviour of green timber, please see our website, or our guide 'Timber Framing with Carpenter Oak & Woodland'.*

Frame shrinkage is the key issue for glazing systems, which must be specially designed to allow for, and accommodate this movement. In inflexible systems it is pretty much a certainty that leakage will occur as the frame shrinks away from the glazing and in worst cases the glazing units can break. As a precursor to achieving a good glazing solution it is essential that it has a good quality frame to sit on – well manufactured from straight grained defect free timber.

Glazing to timber frames is rightly considered to be a stunning feature particularly when the area to be glazed is substantial. It is worth bearing in mind during the buildings design that the size of the glazed panels will have a number of implications. Firstly the thermal rating of the unit must be good because it will have a material effect on the overall rating of the building. We recommend a minimum U-Value of 1.2 w/m k, and this is the usual standard specified in our system. Better rated units are increasingly available, such as triple glazed systems which can achieve a U-Value of 0.8 w/mk, but of course these come at a cost. If you are interested in more details, please give us a call. Secondly, when a glazing panel exceeds 2 square metres, the cost per square metre increases by 50%. Whether this increases the overall cost of the project will depend on the installation costs. Each project has its own unique optimal cost profile and we can advise you on the best approach.

Oak is particularly high in tannin, and with weathering it is inevitable that a degree of staining will occur as the tannins leach out. Although tannin stains can be removed they are acidic and can eat at some materials such as lead flashings and ferrous fixings. It is essential that the glazing is properly detailed and that the materials used are appropriate. All the fixings we use are stainless steel and the best material for flashing is copper.

Glazing Systems for Timber Frames

Glazing systems for timber frames basically fall into two categories:

- 1) opening and non opening, and
- 2) inset joinery, or glazing directly applied to the frame.

Over the years Carpenter Oak & Woodland have developed tried and tested systems for both directly mounted glazing and glazing housed in its own joinery frame.

We strongly recommend that any element that can be non opening (fixed) is surface mounted, and that only where openings are required (i.e. doors or windows), complete joinery items are inset into the frame.

From a practical point of view, the surface mounted solution can be said to be preferable because it is specially designed to allow for timber shrinkage and movement, and therefore requires less maintenance. This is not to say that inset joinery will give a problem, just that when the oak frame inevitably shrinks away from the joinery frame, work will be required to ensure that the seal between the two remains intact.

With very large areas of glazing the thermal properties of the system become crucial not just to the unit, but also to the building as a whole. The surface mounted method delivers much better performance to inset joinery because it has several preferable attributes

- Less cold bridging (where the overall performance of the unit is compromised by an element which has much lower thermal resistance i.e. it transmits heat and cold more readily)
- Less opportunities for gaps to appear
- More wind resistant
- Lower maintenance

Surface mounted glazing also benefits from being more cost effective, and because it doesn't have a separate frame.

Aesthetically, there is a significant difference. Where the glazing is surface mounted, the glazed area is larger than where a separate joinery frame takes up some of the space between the frame, (see Fig 1 below). Surface mounted glazing, therefore allows more light in and presents fewer interruptions to views.



Fig 1: The unit to the left of the main post is a glazed door, typical of a joinery item with a frame which sits within the primary structure. On the right of the main post is a surface mounted fixed pane, where no secondary frame is required and therefore the whole aperture is glazed.

Surface mounted glazing

With this method, the glazing is mounted onto the outside face of the oak frame and covered externally by a piece of timber (a coverboard) matched to the internal timber. Aesthetically the two pieces appear to be one single piece with the glass recessed into it.



Fig 2: Surface mounted glazing; a series of fixed glazing panels mounted onto studs and then faced with an oak cover board. Note the visual effect is that the glass is recessed into a single stud.

Between the cover board and the internal oak frame sits a timber packer and a series of seals designed to allow movement of the frame while maintaining a wind and watertight seal. This detail was originally designed by Carpenter Oak & Woodland in conjunction with Pilkington Glass and a local glazing company, and has proved highly successful. The original design has since been developed into a double-seal, pressure-equalised system using similar principles to those used in the glazing of multi-storey office blocks. Rather than trying to completely exclude rainwater, which will always find the tiniest flaw, the system allows a certain amount of water to penetrate the outer seal and then drain out through a series of drainage channels. Nothing is allowed to penetrate the inner seal. The pressure equalised system means that, at the same time as allowing water to escape, air is allowed into the drainage channels preventing the build up of water within the channel through surface tension. A less effective system can be prone to the buffeting of the glass in strong wind which sets up a pumping action, effectively forcing water through an inner seal and entering the building.

Fig 3: Unusually shaped units can more easily be accommodated when surface mounted



Inset Joinery glazing

Opening doors and windows need to remain very stable in their frames to ensure that they will operate without snagging, and that no drafty gaps appear. For this reason it is not possible to mount them directly into a green timber frame. Joinery items are therefore set into their own frames and in turn housed into rebates in the oak frame, or preferably applied to the front face of the internal member behind cover boards as described above, (see Fig 4). The weatherproofing then sits between the joinery frame and the green frame to accommodate movement of the green timbers.

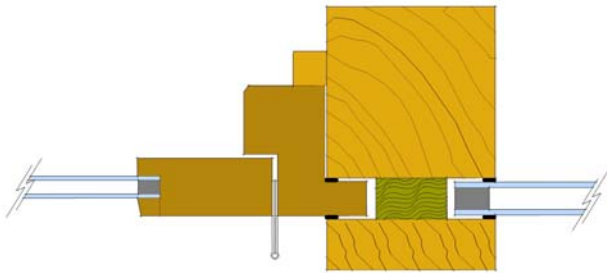


Fig 4: A simplified diagram showing our recommended detailing for joinery inserts. To the right of the main post is a surface mounted glazing panel. To the left, an inserted joinery frame is attached using the same technique, with seals sitting between the main post and the cover board.

Carpenter Oak & Woodland have developed a comprehensive series of technical drawings for glazing details, and would be pleased to discuss them with you. Please call our offices if you would like further details.

We also have a large number of images of glazing projects in our library which we would be pleased to share with you. The following show some typical usages and appearances, however please don't hesitate to contact our offices if you would like to see more specific examples..

Fig 5: A small lean-to sunroom with joinery doors to the end gable, and two opening windows. Note the visual appearance of these and the surface mounted panels.





Fig 6: Detail of joinery frame mounted to the main frame on the external posts. Beadings are attached internally to cover the gap which will appear between the frames as the green elements shrink.

Warranty

Whatever glazing method is used the success of any installation will ultimately depend on the quality of the materials used and the skill and experience of the installers.

Under our warranty:

- The glazing units carry a 5 year manufacturer's guarantee against seal failure. In the unlikely event that the units fail, these will be replaced free of charge.
- The installation of the units is guaranteed for a period of 3 years against defects in materials and workmanship.

Technical Specification

Glazing Units	<p>Double glazed IGU (Insulated Glass Unit), 4mm safety toughened glass with 16mm void. Argon filled. Low-E coating. U-Value of 1.2 w/m k</p> <p>OPTIONS: Bioclean coating 6mm safety toughened glass</p>
Joinery Units	<p>Premium grade kiln dried oak. Planed and untreated finish</p> <p>OPTIONS: Trickle vents</p>
Cover Boards	<p>Premium grade kiln dried oak. Sawn and planed, untreated finish</p>
Packers	<p>Kiln dried stable larch Untreated</p>
Fixings	Stainless steel
Plugs	Oak, to match cover boards.
Tape	EPDM black rubber glazing tape to form a double-seal, pressure-equalised system.
Flashings	0.6mm copper
Hinges	<p>3 Parliament hinges per door. Window hinges as appropriate to window weight and orientation. Finish to be specified by client.</p>

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